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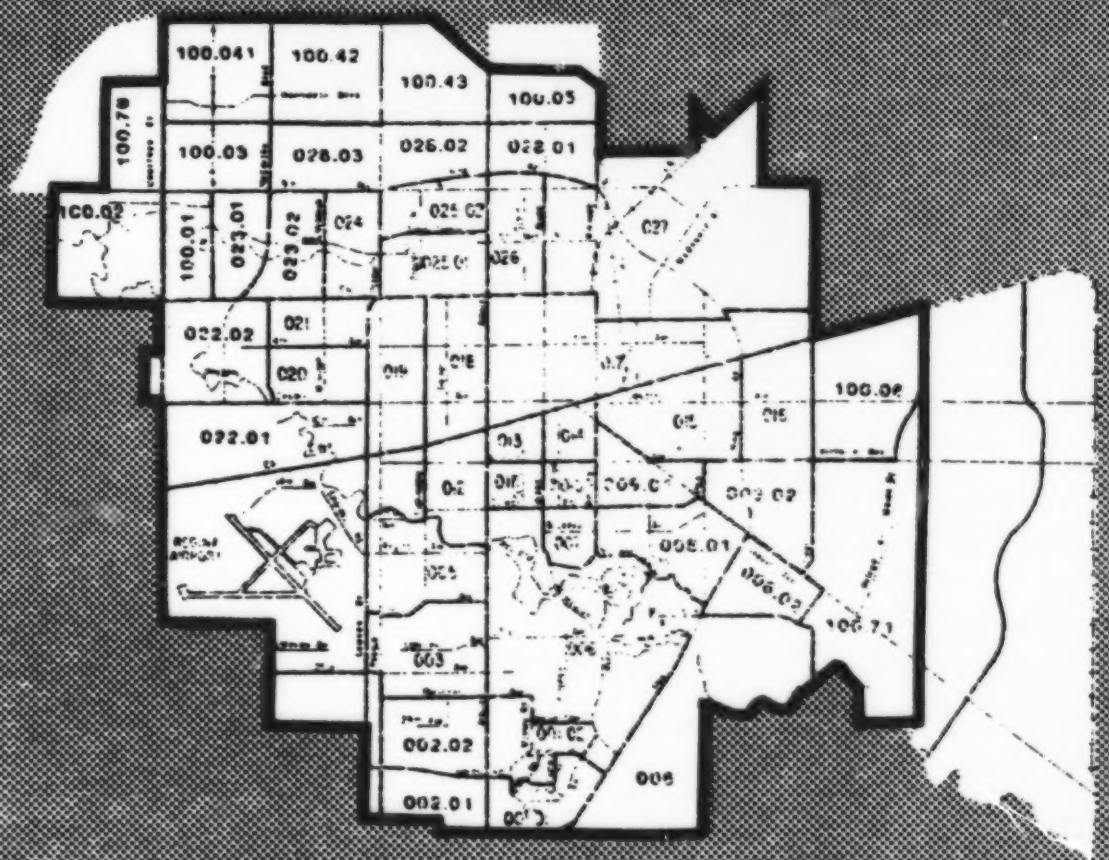
Land Absorption, Population and Housing Distribution



CITY OF REGINA
URBAN PLANNING DEPT.

NOV./87

REGINA 1987 - 2006 LAND DEVELOPMENT

Land Absorption, Population and Housing Distribution

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NOTE

Note that projections of population for sectors of the City as presented in this report reflect (1) an assumption that present densities of development, in dwelling units per hectare, will continue until the end of the forecast period and (2) calculations of the rate of decline in occupancy rates over time - that is, neighbourhoods being developed now will be declining in population by the time future neighbourhoods in the sector are developing. Thus, the projection numbers are lower than estimates of the capacity of the sector which are based upon the service capacity of the sector (sewer, water, etc.) and which are found in the Regina Development Plan (Sector Plans).

Since density is measured in dwelling units per hectare, the lower population figures do not indicate lower density - they just reflect the fact that occupancy, or number of people per dwelling unit, drops soon after a neighbourhood is fully developed.

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REGINA 1987 - 2006 LAND DEVELOPMENT:
Land Absorption, Population and Housing Distribution

1. Purpose

This report has been prepared to illustrate and project the City's growth in terms of population and housing distribution, and the required land for development over the next twenty years.

2. Background

The most important factors which characterize Regina in spatial terms are:

a) population decline in the City interior * and population growth in the City periphery,

b) absence of significant infill development in the City interior, and,

c) the continuing decline of occupancy levels of dwelling units.

2.1 Dwelling Units Occupancy Levels

Table 1 describes the total population and occupied dwelling units (D.U.) in each Census Tract (C.T.) for the years 1981 and 1986.

Regina has been experiencing an on going decline in the average occupancy rates of D.U. In 1961, the occupancy rate in Regina was 3.72 person/D.U. This has declined to 3.51 (1966), 3.3 (1971), 3.03 (1976) and 2.79 (1981). By 1986, however, the rate of decline had decelerated, and the occupancy rate was 2.72 person/D.U.

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* The City interior refers to all established residential areas in the City, including the inner City and all suburban neighborhoods where development is completed.

The decline in the occupancy rates is a result of both the decreasing fertility rates and the increasing rates of independent living *. The recent slower rate of decline in occupancy rates is the result of a slow down in the decline of fertility rates.

In addition, high unemployment rates among young persons in recent years has contributed to the deceleration of the decline in occupancy rates. Youth unemployment delays the creation of new, non-family households and the formation of new empty nester households.

2.2 Infill Development

Between 1981 and 1986 there has been significant infill development within the City interior only in the Downtown, the Transitional and part of the Cathedral areas, and Albert-Scott neighborhood. The overall net housing growth within the City interior, however, was only marginal due to housing demolition in the area. **

Overall, a net of only 273 D.U., or 4.6% of the overall housing growth, was developed in the City interior. An overwhelming majority of the 5,986 D.U. (net growth) took place in the City periphery in the 1981-1986 period.

2.3 Declining Population in the City Interior

Both the absence of significant infill development within the City interior and the decline in the rates of D.U. occupancy. contribute to depopulation of the area.

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* Refer to a previous report: Regina Social Housing Strategy / Long Term Housing Requirements, 1986. The study reveals a trend of significant increase in household headship rates among the age group 15-24: in 1961 the male population of this age-group comprised 18.2% of the total household headship population. That has increased to 26.1% in 1981. The female headship increase was more dramatic - from 4% in 1961 to 19.6% in 1981. Independent living has been increasing also due to higher divorce rates in the 80's as compared to twenty years earlier.

** City interior, in terms of the housing development between 1981 and 1986 excludes the following Census Tracts: the group of C.T. 100 and 28, C.T. 8.08 and 9.02 (South-East sector), 2.01 (Albert-Park South) and 16.00 (East sector).

In order to evaluate the rate of depopulation within neighborhoods of declining population, a Depopulation Scale can be used. The scale which ranges from 0 (no population change) to -100 (absolute depopulation), was developed by the City of Regina Planning Department to analyze the 1981 Census.*

The scale measures the present population of the declining neighborhoods against a previous population count and the previous overall City population. The 1981-86 Regina rate of -6.4 was lower as compared to proceeding 5-year term. However, this was still higher compared to the 1971-76 period which had a rate of -5.0.

Between 1981 and 1986, the depopulation level in the City interior has dropped as compared to the period 1976-81, in which Regina was ranked the most severe among the five major cities of Western Canada. In the 5-year period between 1976-81 Regina was rated -9.4 on the Depopulation Scale. Saskatoon had the second level of -7.1, Winnipeg -7.0, Edmonton -5.8 and Calgary -1.8.

Based on examination of land and housing costs among the cities, it appears that low land costs on the periphery contribute to the high depopulation levels within the city interior.

A review of the location of the declining population areas between 1981-86 (Map 2), identifies small changes compared to the period 1976-81.** On one hand, the west part of the City core, previously a declining population area, is now an increasing population area due to infill developments (C.T. 11, 12, 13 and 18). On the other hand, Normanview West (C.T. 23.01) and Highland Park (C.T. 26) have joined the declining population areas.

3. Projections: Housing, Land and Population

The projection model establishes:

(1) the overall housing requirements and their spatial distribution,

(2) the corresponding land requirements, and

(3) the population which occupies the overall housing stock (refer to the methodology in appendix A).

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* Planning Department: Overview of Regina's Development and Population Trends, March 1983, Appendix A and Table 17

** ibid., compare to Map 3: Changing Population 1976 - 1981

3.1 Housing and Land Requirements

The assumption behind the projection of future housing development is that the present location and density trends will continue. This suggests:

- that 100% of the future net growth will take place in the City periphery and infill development within the City interior will be balanced by demolition activities there.
- that proportional shares of development in each sector- North-West, South-East and East, will continue.
- that present densities in each sector will continue in future adjacent neighborhoods.

Table 2 documents housing requirements for the North-West, South-East and East Sectors in succeeding 5-year periods. The information is based on the projection of the overall housing requirements and on the analysis of the development ratio between the sectors during the past 10 years. The ratio of 47% of housing development in the North-West, 42% in the South-East, and 11% in the East, is extrapolated into the future.

Table 3.1 describes the overall development potential of D.U. for each C.T. in the North-West, South-East and East sectors. The total D.U's designated for development in areas already subdivided, the available hectares (up to the proposed relocated rail lines in the North-West, and the rail lines in the East), and the assumed gross densities for each C.T., suggest a development potential of 27,696 D.U.

Table 3.2, which combines Table 2 and 3.1, contains the projected housing distribution for each C.T. based on known development priorities. This scale is based on the proximity to existing development and the overall periodic need for housing.

The assumption behind the use of a development ratio of each sector for the purpose of projection is that the development in each sector is related to the housing markets of different consumer groups (based on different socio-economic attributes). This is maintained as long as land supply in each sector is available. When land development reaches the proposed rail lines in the North-West (by 2001), development is redirected to the East and the South-East sector.

Given the spatial distribution of the development rates, all available lands (including land extending between the present City limits to the proposed rail lines in the North-West, and the rail line in the East) will be absorbed by the year 2007.

Table 4 shows the land required for housing development for each sector, and the amount of land which needs to be annexed (1,430 hectares) to accommodate this growth. Table 5 shows the land absorbed by C.T. by time period.

3.2 Population

Having established the housing and land requirements, the population can be estimated by projecting the occupancy rates for each C.T. For this purpose, a regression analysis was developed to assess the difference between levels of occupancy in succeeding Census years (Appendix A).

Occupancy rates reflect changes in the life cycle of a neighborhood. When first developed, a neighborhood tends to be occupied by younger families. Over the years, formation of "empty nester" families occurs and lower occupancy rates result. This is amplified when replacement of young families in a neighborhood is slow due to a low rate of infill development.

Thus, the decline in population and occupancy rates continues. Finally, the aging process of a neighborhood results in declining occupancy down to a constant minimum.

The results of the regression analysis are shown in Figure 1. This chart illustrates the relationship between the occupancy rates in 1981 and the rates of decline to 1986. The higher the occupancy rate was in 1981, the greater the decrease was by 1986. The coefficients of this regression are implemented for the projection purposes in Table 6.1 through 6.4 which provide, for each 5-year period:

- the existing housing stock and its projected occupancy rates by C.T. (based on average occupancy rates of the preceding years, the regression coefficients and the assumption that occupancy rates gradually decline to a minimum of 1.8 person/D.U. and then remain constant).

- the housing stock which will be developed throughout the 5-year periods and the starting occupancy rate of 3.1 person/D.U. in the North-West and the East sectors, and 3.0 person/D.U. in the South-East sector.

- the total population and the average occupancy rates based on the previous components.

Tables 7 and 8 provide the resulting statistics of population and D.U. for each C.T. (Note the total population for each 5-year term is close to the totals established through cohort survival model and given in a previous Planning Department Study: Regina-Social Housing Strategy / Long Term Housing Requirements, 1986).

4. Conclusions

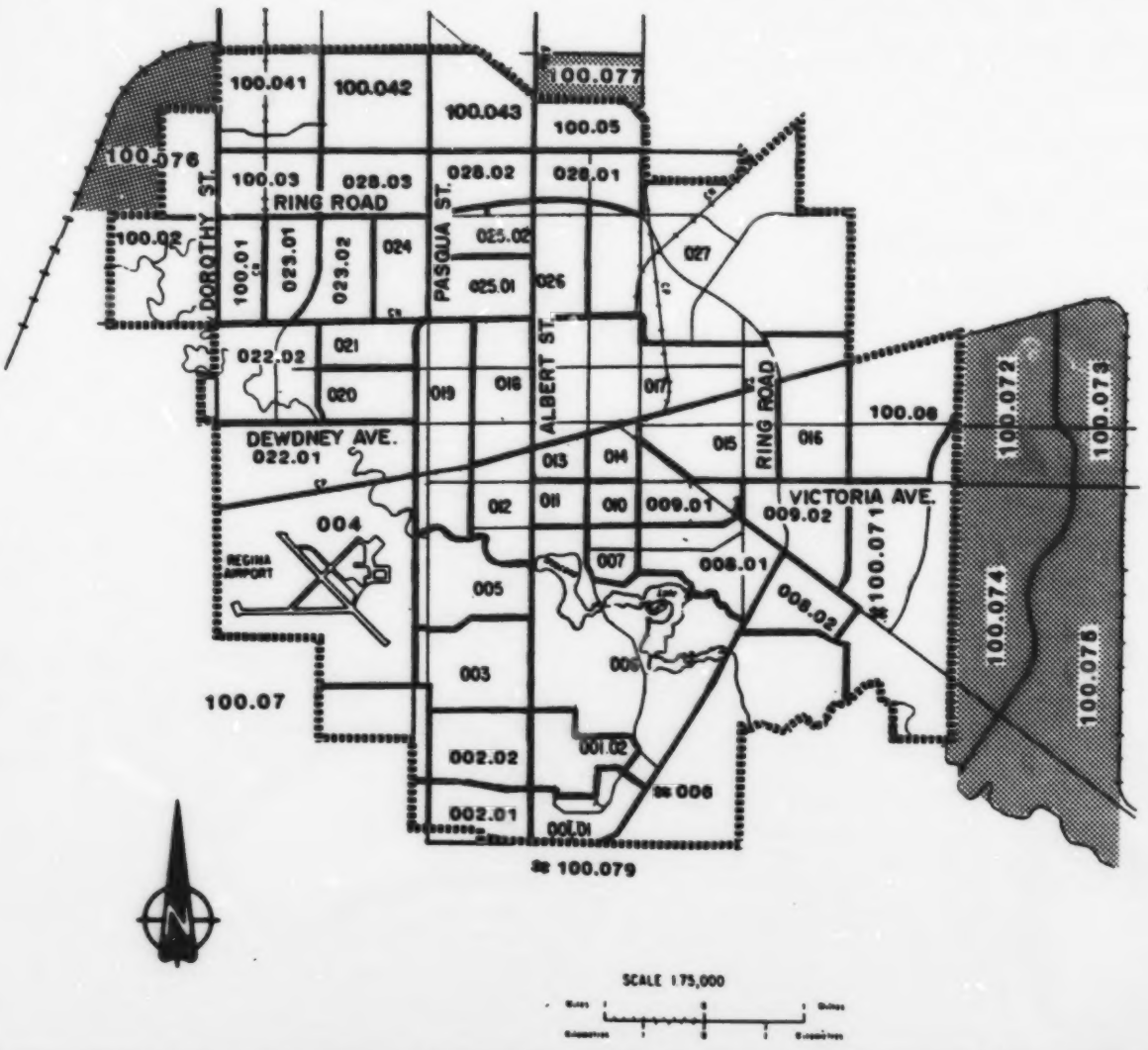
The City interior has not been a significant location for new housing. If the emphasis on peripheral development continues, the 1,083 hectares (976 unsubdivided hectares) presently available for development within the City limits will be used by the year 1994. If development destinations cannot be redirected, the present 196 hectares in the South-East will be used as early as 1991.

An additional 1,430 hectares outside the City limits in the North-West and the South-East, up to the proposed rail lines, must be annexed in the next few years. Notably, these lands would be developed by the year 2007.

The preceding findings illustrate the limits of land reserves for future City expansion. The need to examine development objectives regarding efficient land use is highlighted. This should address two development targets:

- City interior - the need to increase infill development.
- City periphery - the need to optimize development density in peripheral areas.

REGINA CENSUS TRACTS



NOTE : PLANNING DEPT. HAS RESUBDIVIDED CENSUS TRACT 100.07 TO REFLECT THE CITY BOUNDARIES

AREA OUTSIDE THE CITY LIMITS

MAP 1

Table 1: Total Population and Occupied Private Dwellings by C.T. June 1986

Census Tract	Population			Dwelling Units (D.U.)**			Person / D.U. **		
	1981	1986	Change	1981	1986	Change	1981	1986	Change
1.01	4,131	3,789	-342	1,159	1,176	17	3.56	3.22	-0.34
1.02	4,455	4,125	-330	1,550	1,534	-16	2.87	2.69	-0.19
2.01	3,849	4,205	356	1,321	1,592	271	2.91	2.64	-0.27
2.02	7,448	6,917	-531	2,782	2,710	-72	2.62	2.40	-0.22
3.00	5,593	5,257	-336	2,222	2,207	-15	2.52	2.38	-0.13
4.00	2,073	1,914	-159	850	817	-33	2.44	2.34	-0.10
5.00	4,920	4,693	-227	1,837	1,806	-31	2.68	2.53	-0.15
6.00*	6,192	5,737	-455	2,387	2,282	-105	2.50	2.38	-0.12
7.00	1,789	1,775	-14	779	757	-22	2.30	2.34	0.05
8.01	6,548	6,050	-498	2,487	2,421	-66	2.63	2.50	-0.13
8.02	2,669	3,162	493	749	1,024	275	3.56	3.09	-0.48
9.01	4,435	4,288	-147	1,835	1,814	-21	2.42	2.36	-0.05
9.02	2,584	4,065	1,481	968	1,365	397	2.67	2.98	0.31
10.00	2,802	2,661	-141	1,425	1,372	-53	1.94	1.90	-0.04
11.00	3,300	3,743	443	2,472	2,872	400	1.33	1.30	-0.03
12.00	5,342	5,479	137	2,472	2,681	209	2.16	2.04	-0.12
13.00	192	434	242	97	244	147	1.98	1.77	-0.20
14.00	1,992	1,817	-175	858	800	-58	2.32	2.27	-0.05
15.00	2,582	2,423	-159	852	810	-42	3.03	2.99	-0.04
16.00	6,703	6,992	289	1,994	2,207	213	3.36	3.17	-0.19
17.00	2,162	1,989	-173	713	702	-11	3.03	2.83	-0.20
18.00	6,022	6,289	267	2,297	2,446	149	2.62	2.57	-0.05
19.00	4,713	4,582	-131	1,852	1,853	1	2.54	2.45	-0.09
20.00	3,477	3,156	-321	1,346	1,310	-36	2.58	2.41	-0.17
21.00	2,751	2,487	-264	1,010	956	-54	2.72	2.60	-0.12
22.01	2,571	2,166	-405	764	745	-19	2.30	2.23	-0.08
22.02*	5,809	5,792	-17	1,723	1,765	42	3.37	3.28	-0.09
23.01	4,074	3,738	-336	1,112	1,098	-14	3.66	3.40	-0.26
23.02	4,682	4,472	-210	1,544	1,408	-136	3.03	3.18	0.14
24.00	3,697	3,358	-339	1,077	1,077	0	3.43	3.12	-0.31
25.01	4,382	4,026	-356	1,537	1,537	0	2.85	2.62	-0.23
25.02	3,836	3,570	-266	1,317	1,344	27	2.86	2.60	-0.26
26.00	4,248	4,195	-53	1,702	1,758	56	2.50	2.39	-0.11
27.00	4,074	3,804	-270	1,304	1,333	29	3.12	2.85	-0.27
28.01	3,605	3,789	184	989	1,088	99	3.65	3.48	-0.16
28.02	3,461	4,431	970	1,005	1,289	284	3.44	3.44	-0.01
28.03	5,291	5,376	85	1,522	1,567	45	3.48	3.43	-0.05
100.01	2,542	4,506	1,964	765	1,308	543	3.32	3.44	0.12
100.02	0	258	258	0	74	74	N/A	3.49	N/A
100.03	5,195	6,650	1,455	1,671	1,965	294	3.11	3.38	0.27
100.04	7	3,691	3,684	0	1,219	1,219	N/A	3.03	N/A
100.05	2,629	2,805	176	811	842	31	3.24	3.33	0.08
100.06	4,124	6,197	2,073	1,259	1,825	566	3.28	3.40	0.12
100.071*	44	4,221	4,177	15	1,399	1,384	2.93	3.02	0.09
Total	162,995	175,074	12,079	58,431	64,399	5,968	2.79	2.72	-0.07
100.079*	1,329	1,425	96	409	424	15	3.25	3.36	0.11

* C.T. 100.07 was subdivided by the Urban Planning Department to reflect the City boundaries with the R.M. of Sherwood (indicated here as 100.079).

** In order to provide accurate occupancy rates, population totals were adjusted to include only residents of private dwelling units.

Table 2: Dwelling Units Development: 1987 - 2006

Sector	Share	1987-91	1991-96	1996-01	2001-06	Total
N.W.	47.00%	2,965	3,052	2,921	3,352	12,289
S.E.	42.00%	2,650	2,727	2,610	2,995	10,982
East	11.00%	694	714	684	785	2,876
Total	100.00%	6,309	6,493	6,214	7,132	26,148

Source: Planning Department (Subdivision Plan Density Inventory and Long Renge Housing Requirements).

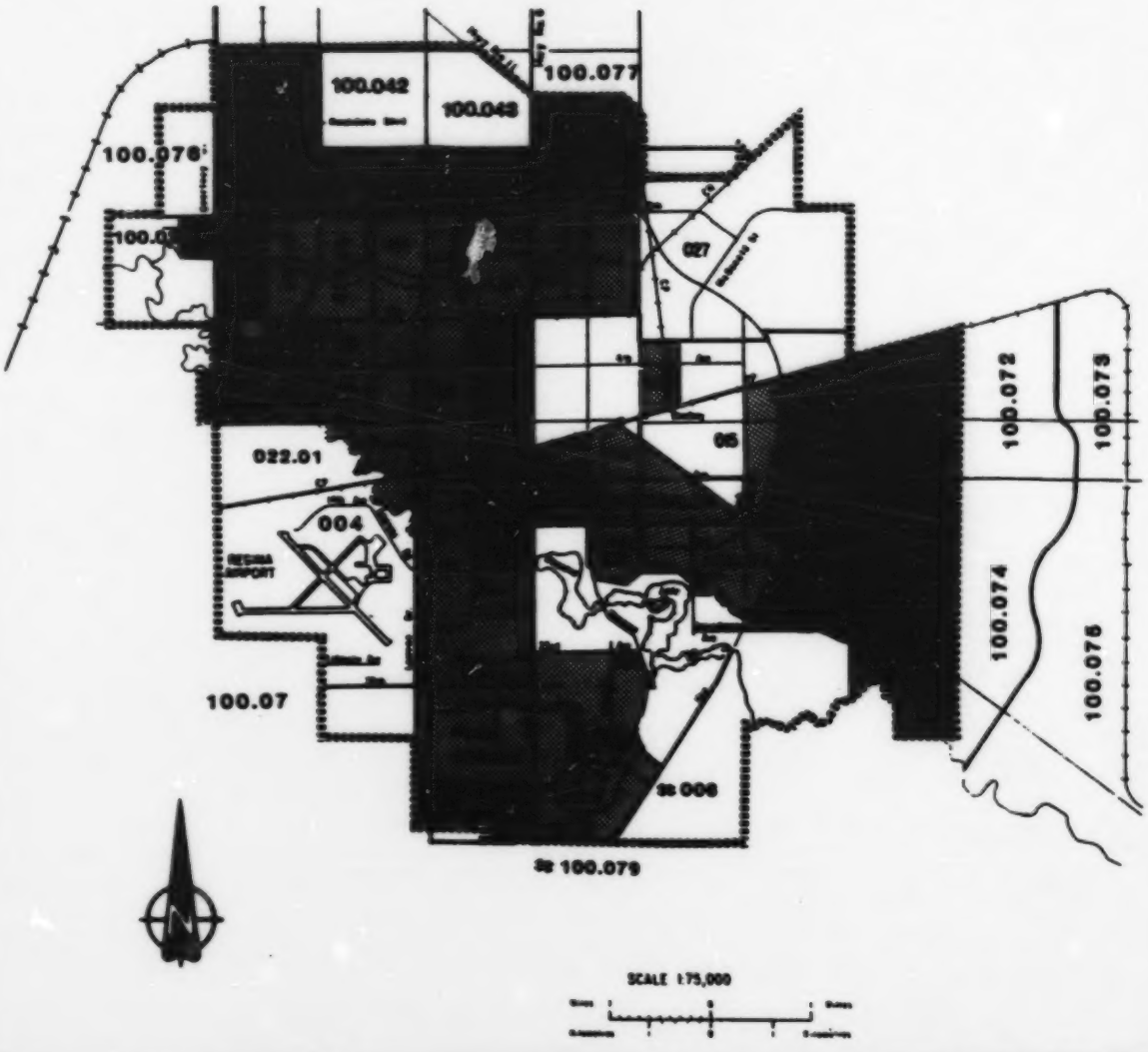
Table 3.1: Potential Development of Dwelling Units

Sector	Census Tract	D.U. Planned	Available Hectares	Density DU/Hec.	D.U. Potential
S.E.	8.02	70			70
East	16.00	54			54
East	100.06		53	13.0	690
S.E.	100.071	253	196	10.9	2,385
N.W.	100.02	225	165	9.1	1,725
N.W.	100.03	56			56
N.W.	100.076		283	9.7	2,754
N.W.	100.041	434	44	9.7	962
N.W.	100.042		210	11.3	2,381
N.W.	100.043		180	11.3	2,036
N.W.	100.077		100	11.3	1,131
East	100.072		210	13.0	2,733
East	100.073		150	13.0	1,952
S.E.	100.074		500	10.9	5,439
S.E.	100.075		315	10.9	3,427
Total		1,092	2,406	11.1	27,696

Table 3.2: Distribution of Development of Dwelling Units: 1987 - 2006

Sector	Census Tract	Development Priority	1987-91	1991-96	1996-01	2001-06	After 2006
S.E.	8.02	1	70				0
East	16.00	1	54				0
East	100.06	1	640	50			0
S.E.	100.071	1	2,385				0
N.W.	100.02	1	1,725				0
N.W.	100.03	1	56				0
N.W.	100.076	3			746	2,007	0
N.W.	100.041	1	862				0
N.W.	100.042	1	322	2,059			0
N.W.	100.043	3			2,036		0
N.W.	100.077	2		992	139		0
East	100.072	2		664	684	1,386	0
East	100.073	4				1,952	0
S.E.	100.074	1	194	2,727	2,518		0
S.E.	100.075	3			92	1,787	1,548
Total			6,309	6,493	6,214	7,132	1,548

CHANGING POPULATION
1981-1986



NOTE : PLANNING DEPT. HAS RESUBDIVIDED CENSUS TRACT 100.07 TO REFLECT CITY BOUNDARIES

DECREASING POPULATION

INCREASING POPULATION

MAP 2

Table 4: Overall Available Land *

Sector	City Limits	To be Annexed	Overall
North-West	727	255	982
South-East	196	815	1,011
East	53	360	413
Total	976	1,430	2,406

* This includes the unsubdivided lands north-west and south-east of the City, between the subdivided lands and the railway tracks. Also included are 142 hectares to be developed after the year 2006.

Table 5: Land Absorption 1987 - 2006; N.W., S.E. & East Sectors

Sector	C.T.	1987-91*	1991-96	1996-01	2001-06	Total
East	100.06	49	4	0	0	53
East	100.072	0	51	53	106	210
East	100.073	0	0	0	150	150
Subtotal		49	55	53	256	413
N.W.	100.02	165	0	0	0	165
N.W.	100.041	44	0	0	0	44
N.W.	100.042	28	182	0	0	210
N.W.	100.043	0	0	180	0	180
N.W.	100.076	0	0	77	206	283
N.W.	100.077	0	88	12	0	100
Subtotal		237	269	269	206	982
S.E.	100.071	196	0	0	0	196
S.E.	100.074	18	251	231	0	500
S.E.	100.075	0	0	8	164	173
Subtotal		214	251	240	164	869
Total		500	575	561	627	2,264

* This table describes lands which have not been subdivided yet. An additional 108 subdivided hectares will contain 1,092 dwelling units to be developed before 1991.

Table 6.1: 1986-1991 Dwelling Units Stock and Occupancy Rates

Census Tract	D.U. Existing #	D.U. Existing Occ.	D.U. Planned #	D.U. Planned Occ.	Total Pop.	Average Occ.
1.01	1,176	3.00			3,527	3.00
1.02	1,534	2.57			3,948	2.57
2.01	1,592	2.55			4,053	2.55
2.02	2,710	2.46			6,668	2.46
3.00	2,207	2.30			5,074	2.30
4.00	817	2.28			1,865	2.28
5.00	1,806	2.50			4,510	2.50
6.00	2,282	2.43			5,538	2.43
7.00	757	2.28			1,730	2.28
8.01	2,421	2.42			5,849	2.42
8.02	1,024	2.89	70	3.10	3,181	2.91
9.01	1,814	2.30			4,174	2.30
9.02	1,365	2.81			3,833	2.81
10.00	1,372	1.93			2,647	1.93
11.00	2,872	1.30			3,743	1.30
12.00	2,681	2.02			5,422	2.02
13.00	244	1.78			434	1.78
14.00	800	2.17			1,733	2.17
15.00	810	2.82			2,283	2.82
16.00	2,207	2.96	54	3.10	6,695	2.96
17.00	702	2.69			1,890	2.69
18.00	2,446	2.48			6,057	2.48
19.00	1,853	2.30			4,271	2.30
20.00	1,310	2.34			3,065	2.34
21.00	956	2.50			2,391	2.50
22.01	745	2.75			2,050	2.75
22.021	1,715	3.05			5,238	3.05
22.022	50	2.75			137	2.75
23.01	1,098	3.14			3,447	3.14
23.02	1,408	2.96			4,173	2.96
24.00	1,077	2.92			3,143	2.92
25.01	1,537	2.52			3,868	2.52
25.02	1,344	2.55			3,423	2.55
26.00	1,758	2.32			4,079	2.32
27.00	1,333	2.71			3,610	2.71
28.01	1,088	3.20			3,480	3.20
28.02	1,289	3.16			4,079	3.16
28.03	1,567	3.16			4,951	3.16
100.01	1,308	3.17			4,147	3.17
100.02	74	3.20	1820	3.10	5,879	3.10
100.03	1,965	3.12	99	3.10	6,446	3.12
100.041	1,219	2.85	1119	3.00	6,828	2.92
100.042			322	3.10	998	3.10
100.043						
100.05	842	3.08			2,597	3.08
100.06	1,825	3.13	1188	3.10	9,400	3.12
100.071	1,399	2.84	2855	3.10	12,823	3.01
100.072						
100.073						
100.074			194	3.00	583	3.00
100.075						
100.076						
100.077						
Total	64,399		7,722		189,963	2.63

Table 6.2: 1991-1996 Dwelling Units Stock and Occupancy Rates

Census Tract	D.U. Existing #	D.U. Existing Occ.	D.U. Planned #	D.U. Planned Occ.	Total Pop.	Average Occ.
1.01	1,176	2.82			3,322	2.82
1.02	1,534	2.48			3,802	2.48
2.01	1,592	2.46			3,909	2.46
2.02	2,710	2.38			6,459	2.38
3.00	2,207	2.25			4,956	2.25
4.00	817	2.23			1,824	2.23
5.00	1,806	2.41			4,360	2.41
6.00	2,282	2.36			5,374	2.36
7.00	757	2.23			1,691	2.23
8.01	2,421	2.35			5,679	2.35
8.02	1,094	2.75			3,010	2.75
9.01	1,814	2.25			4,077	2.25
9.02	1,365	2.67			3,646	2.67
10.00	1,372	1.92			2,634	1.92
11.00	2,872	1.30			3,743	1.30
12.00	2,681	2.00			5,371	2.00
13.00	244	1.78			434	1.78
14.00	800	2.13			1,704	2.13
15.00	810	2.68			2,170	2.68
16.00	2,261	2.79			6,318	2.79
17.00	702	2.58			1,808	2.58
18.00	2,446	2.40			5,862	2.40
19.00	1,853	2.25			4,170	2.25
20.00	1,310	2.28			2,988	2.28
21.00	956	2.42			2,312	2.42
22.01	745	2.62			1,956	2.62
22.021	1,715	2.87			4,919	2.87
22.022	50	2.62			131	2.62
23.01	1,098	2.94			3,223	2.94
23.02	1,408	2.80			3,937	2.80
24.00	1,077	2.76			2,973	2.76
25.01	1,537	2.43			3,736	2.43
25.02	1,344	2.46			3,301	2.46
26.00	1,758	2.26			3,980	2.26
27.00	1,333	2.59			3,452	2.59
28.01	1,088	2.98			3,244	2.98
28.02	1,289	2.96			3,809	2.96
28.03	1,567	2.95			4,624	2.95
100.01	1,308	2.96			3,871	2.96
100.02	1,894	2.91			5,507	2.91
100.03	2,064	2.92			6,032	2.92
100.041	2,338	2.76			6,457	2.76
100.042	322	2.90	2,059	3.10	7,319	3.07
100.043						
100.05	842	2.89			2,435	2.89
100.06	3,013	2.92	50	3.10	8,952	2.92
100.071	4,254	2.84			12,067	2.84
100.072			664	3.10	2,059	3.10
100.073						
100.074	194	2.83	2,727	3.00	8,731	2.99
100.075						
100.076						
100.077			992	3.10	3,076	3.10
Total	72,121		6,493		201,413	2.56

Table 6.3: 1996-2001 Dwelling Units Stock and Occupancy Rates

Census Tract	D.U. Existing #	D.U. Existing Occ.	D.U. Planned #	D.U. Planned Occ.	Total Pop.	Average Occ.
1.01	1,176	2.68			3,157	2.68
1.02	1,534	2.40			3,679	2.40
2.01	1,592	2.38			3,787	2.38
2.02	2,710	2.32			6,282	2.32
3.00	2,207	2.20			4,854	2.20
4.00	817	2.19			1,787	2.19
5.00	1,806	2.34			4,234	2.34
6.00	2,282	2.29			5,234	2.29
7.00	757	2.19			1,657	2.19
8.01	2,421	2.29			5,533	2.29
8.02	1,094	2.63			2,872	2.63
9.01	1,814	2.20			3,990	2.20
9.02	1,365	2.56			3,493	2.56
10.00	1,372	1.91			2,622	1.91
11.00	2,872	1.30			3,743	1.30
12.00	2,681	1.99			5,325	1.99
13.00	244	1.78			434	1.78
14.00	800	2.10			1,679	2.10
15.00	810	2.57			2,078	2.57
16.00	2,261	2.66			6,014	2.66
17.00	702	2.48			1,741	2.48
18.00	2,446	2.33			5,697	2.33
19.00	1,853	2.20			4,084	2.20
20.00	1,310	2.23			2,921	2.23
21.00	956	2.35			2,244	2.35
22.01	745	2.52			1,878	2.52
22.021	1,715	2.72			4,554	2.72
22.022	50	2.52			126	2.52
23.01	1,098	2.77			3,046	2.77
23.02	1,408	2.66			3,748	2.66
24.00	1,077	2.63			2,835	2.63
25.01	1,537	2.36			3,624	2.36
25.02	1,344	2.38			3,198	2.38
26.00	1,758	2.22			3,895	2.22
27.00	1,333	2.49			3,321	2.49
28.01	1,088	2.81			3,058	2.81
28.02	1,289	2.79			3,596	2.79
28.03	1,567	2.79			4,366	2.79
100.01	1,308	2.79			3,653	2.79
100.02	1,894	2.75			5,211	2.75
100.03	2,064	2.76			5,704	2.76
100.041	2,338	2.63	3	3.00	6,166	2.63
100.042	2,381	2.88			6,867	2.88
100.043			2,036	3.10	6,311	3.10
100.05	842	2.74			2,306	2.74
100.06	3,063	2.76			8,465	2.76
100.071	4,254	2.69			11,462	2.69
100.072	664	2.90	684	3.10	4,048	3.00
100.073						
100.074	2,922	2.82	2,518	3.00	15,781	2.90
100.075			92	3.00	276	3.00
100.076			746	3.00	2,238	3.00
100.077	992	2.90	139	3.10	3,312	2.93
Total	78,614		6,217		212,300	2.50

Table 6.4: 2001-2006 Dwelling Units Stock and Occupancy Rates

Census Tract	D.U. Existing #	D.U. Existing Occ.	D.U. Planned #	D.U. Planned Occ.	Total Pop.	Average Occ.
1.01	1,176	2.57			3,023	2.57
1.02	1,534	2.33			3,576	2.33
2.01	1,592	2.31			3,684	2.31
2.02	2,710	2.26			6,130	2.26
3.00	2,207	2.16			4,766	2.16
4.00	817	2.15			1,756	2.15
5.00	1,806	2.28			4,126	2.28
6.00	2,282	2.24			5,114	2.24
7.00	757	2.15			1,628	2.15
8.01	2,421	2.23			5,409	2.23
8.02	1,094	2.52			2,758	2.52
9.01	1,814	2.16			3,920	2.16
9.02	1,365	2.47			3,366	2.47
10.00	1,372	1.90			2,612	1.90
11.00	2,872	1.30			3,743	1.30
12.00	2,681	1.97			5,284	1.97
13.00	244	1.78			434	1.78
14.00	800	2.07			1,657	2.07
15.00	810	2.47			2,002	2.47
16.00	2,261	2.55			5,765	2.55
17.00	702	2.40			1,685	2.40
18.00	2,446	2.27			5,556	2.27
19.00	1,853	2.16			4,008	2.16
20.00	1,310	2.19			2,863	2.19
21.00	956	2.29			2,187	2.29
22.01	745	2.43			1,814	2.43
22.021	1,715	2.60			4,457	2.60
22.022	50	2.43			122	2.43
23.01	1,098	2.64			2,902	2.64
23.02	1,408	2.55			3,592	2.55
24.00	1,077	2.53			2,721	2.53
25.01	1,537	2.30			3,529	2.30
25.02	1,344	2.31			3,111	2.31
26.00	1,758	2.17			3,821	2.17
27.00	1,333	2.41			3,212	2.41
28.01	1,088	2.67			2,908	2.67
28.02	1,289	2.66			3,424	2.66
28.03	1,567	2.65			4,158	2.65
100.01	1,308	2.66			3,478	2.66
100.02	1,894	2.62			4,972	2.62
100.03	2,064	2.63			5,438	2.63
100.041	2,341	2.53			5,919	2.53
100.042	2,381	2.73			6,505	2.73
100.043	2,036	2.90			5,912	2.90
100.05	842	2.61			2,201	2.61
100.06	3,063	2.64			8,071	2.64
100.071	4,254	2.58			10,968	2.58
100.072	1,348	2.83	1,386	3.10	8,107	2.97
100.073			1,952	3.10	6,053	3.10
100.074	5,439	2.75			14,938	2.75
100.075	92	2.83	1,787	3.00	5,620	2.99
100.076	746	2.83	2,007	3.00	8,130	2.95
100.077	1,131	2.77			3,131	2.77
Total	**84,831**		**7,132**		**226,267**	**2.46**

Table 7: Total Population and Occupied Household Dwellings by C.T. - June 19[illegible]

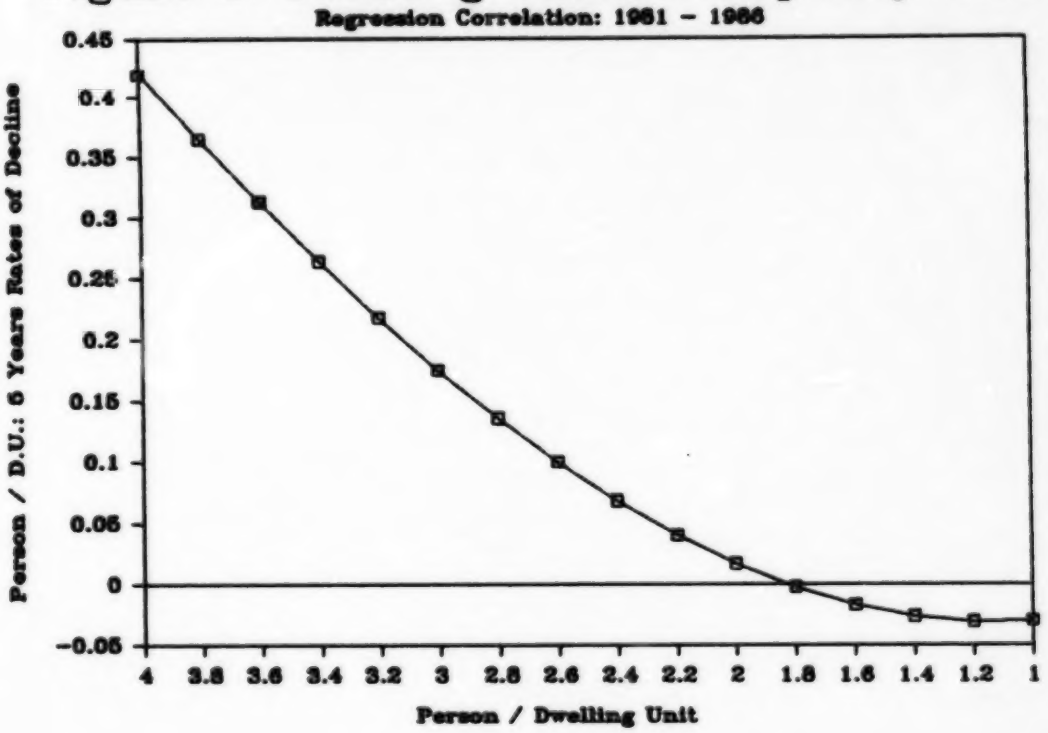
Census Tract	POPULATION					DWELLING UNITS				
	1986	1991	1996	2001	2006	1986	1991	1996	2001	20[illegible]
1.01	3,789	3,527	3,322	3,157	3,023	1,176	1,176	1,176	1,176	1,176
1.02	4,125	3,948	3,802	3,679	3,576	1,534	1,534	1,534	1,534	1,534
2.01	4,205	4,053	3,909	3,787	3,684	1,320	1,592	1,592	1,592	1,592
2.02	6,917	6,668	6,459	6,282	6,130	2,710	2,710	2,710	2,710	2,710
3.00	5,257	5,074	4,956	4,854	4,766	2,207	2,207	2,207	2,207	2,207
4.00	1,914	1,865	1,824	1,787	1,756	817	817	817	817	817
5.00	4,693	4,510	4,360	4,234	4,126	1,806	1,806	1,806	1,806	1,806
6.00	5,737	5,538	5,374	5,234	5,114	2,282	2,282	2,282	2,282	2,282
7.00	1,775	1,730	1,691	1,657	1,628	757	757	757	757	757
8.01	6,050	5,849	5,679	5,533	5,409	2,421	2,421	2,421	2,421	2,421
8.02	3,162	3,181	3,010	2,872	2,758	1,024	1,094	1,094	1,094	1,094
9.01	4,288	4,174	4,077	3,993	3,920	1,814	1,814	1,814	1,814	1,814
9.02	4,065	3,833	3,646	3,493	3,366	1,365	1,365	1,365	1,365	1,365
10.00	2,661	2,647	2,634	2,622	2,612	1,372	1,372	1,372	1,372	1,372
11.00	3,743	3,743	3,743	3,743	3,743	2,872	2,872	2,872	2,872	2,872
12.00	5,479	5,422	5,371	5,325	5,284	2,681	2,681	2,681	2,681	2,681
13.00	434	434	434	434	434	244	244	244	244	244
14.00	1,817	1,733	1,704	1,679	1,657	800	800	800	800	800
15.00	2,423	2,283	2,170	2,078	2,002	810	810	810	810	810
16.00	6,992	6,695	6,318	6,014	5,765	2,207	2,261	2,261	2,261	2,261
17.00	1,989	1,890	1,808	1,741	1,685	702	702	702	702	702
18.00	6,289	6,057	5,862	5,697	5,556	2,446	2,446	2,446	2,446	2,446
19.00	4,582	4,271	4,170	4,084	4,008	1,853	1,853	1,853	1,853	1,853
20.00	3,156	3,065	2,988	2,921	2,863	1,310	1,310	1,310	1,310	1,310
21.00	2,487	2,391	2,312	2,244	2,187	956	956	956	956	956
22.01	2,166	2,050	1,956	1,878	1,814	745	745	745	745	745
22.02	5,792	5,375	5,050	4,790	4,579	1,765	1,765	1,765	1,765	1,765
23.01	3,738	3,447	3,223	3,046	2,902	1,098	1,098	1,098	1,098	1,098
23.02	4,472	4,173	3,937	3,748	3,592	1,408	1,408	1,408	1,408	1,408
24.00	3,358	3,143	2,973	2,835	2,721	1,077	1,077	1,077	1,077	1,077
25.01	4,026	3,868	3,736	3,624	3,529	1,537	1,537	1,537	1,537	1,537
25.02	3,570	3,423	3,301	3,198	3,111	1,344	1,344	1,344	1,344	1,344
26.00	4,195	4,079	3,980	3,895	3,821	1,758	1,758	1,758	1,758	1,758
27.00	3,804	3,610	3,452	3,321	3,212	1,333	1,333	1,333	1,333	1,333
28.01	3,789	3,480	3,244	3,058	2,908	1,088	1,088	1,088	1,088	1,088
28.02	4,431	4,079	3,809	3,596	3,424	1,289	1,289	1,289	1,289	1,289
28.03	5,376	4,951	4,624	4,366	4,158	1,567	1,567	1,567	1,567	1,567
100.01	4,506	4,147	3,871	3,653	3,478	1,308	1,308	1,308	1,308	1,308
100.02	258	5,879	5,507	5,211	4,972	74	1,894	1,894	1,894	1,894
100.03	6,650	6,446	6,032	5,704	5,438	1,965	2,064	2,064	2,064	2,064
100.041	3,691	6,828	6,457	6,166	5,919	1,219	2,338	2,338	2,338	2,338
100.042		998	7,319	6,867	6,506		322	2,381	2,381	2,381
100.043				6,311	5,912				2,036	2,036
100.05	2,805	2,597	2,435	2,306	2,201	842	842	-2	842	842
100.06	6,197	9,400	8,952	8,465	8,071	1,825	3,013	3,063	3,063	3,063
100.071	4221	12,823	12,067	11,462	10,968	1,399	4,254	4,254	4,254	4,254
100.072			2,059	4,048	8,107			664	1,348	2,733
100.073					6,053					1,952
100.074		583	8,731	15,781	14,938		194	2,922	5,439	5,439
100.075				276	5,620				92	1,879
100.076				2,238	8,130				746	2,754
100.077			3,076	3,312	3,131			992	1,131	1,131
Total	175074	189963	201413	212300	226267	64127	72121	78614	84828	91960

* Statistics Canada Census Tracts 100.04 and 100.07, which includes the future City expansion areas, have been subdivided by the Planning Department.

Table 8: Population Change from the Previous 5-Year Term

Census Tract	1986	1991	1996	2001	2006
1.01	-8.3%	-6.9%	-5.8%	-5.0%	-4.3%
1.02	-7.4%	-4.3%	-3.7%	-3.2%	-2.8%
2.01	9.2%	-3.6%	-3.6%	-3.1%	-2.7%
2.02	-7.1%	-3.6%	-3.1%	-2.7%	-2.4%
3.00	-6.0%	-3.5%	-2.3%	-2.1%	-1.8%
4.00	-7.7%	-2.5%	-2.2%	-2.0%	-1.8%
5.00	-4.6%	-3.9%	-3.3%	-2.9%	-2.5%
6.00	-7.3%	-3.5%	-3.0%	-2.6%	-2.3%
7.00	-0.8%	-2.6%	-2.3%	-2.0%	-1.8%
8.01	-7.6%	-3.3%	-2.9%	-2.6%	-2.3%
8.02	18.5%	0.6%	-5.4%	-4.6%	-4.0%
9.01	-3.3%	-2.6%	-2.3%	-2.1%	-1.8%
9.02	57.3%	-5.7%	-4.9%	-4.2%	-3.6%
10.00	-5.0%	-0.5%	-0.5%	-0.4%	-0.4%
11.00	13.4%	0.0%	0.0%	0.0%	0.0%
12.00	2.6%	-1.0%	-0.9%	-0.8%	-0.8%
13.00	126.0%	0.0%	0.0%	0.0%	0.0%
14.00	-8.8%	-4.6%	-1.7%	-1.5%	-1.3%
15.00	-6.2%	-5.8%	-4.9%	-4.2%	-3.7%
16.00	4.3%	-4.3%	-5.6%	-4.8%	-4.1%
17.00	-8.0%	-5.0%	-4.3%	-3.7%	-3.2%
18.00	4.4%	-3.7%	-3.2%	-2.8%	-2.5%
19.00	-2.8%	-6.8%	-2.4%	-2.1%	-1.8%
20.00	-9.2%	-2.9%	-2.5%	-2.2%	-2.0%
21.00	-9.6%	-3.8%	-3.3%	-2.9%	-2.6%
22.01	-15.8%	-5.4%	-4.6%	-4.0%	-3.4%
22.02	-0.3%	-7.2%	-6.1%	-5.1%	-4.4%
23.01	-8.2%	-7.8%	-6.5%	-5.5%	-4.7%
23.02	-4.5%	-6.7%	-5.6%	-4.8%	-4.1%
24.00	-9.2%	-6.4%	-5.4%	-4.6%	-4.0%
25.01	-8.1%	-3.9%	-3.4%	-3.0%	-2.6%
25.02	-6.9%	-4.1%	-3.6%	-3.1%	-2.7%
26.00	-1.2%	-2.8%	-2.4%	-2.1%	-1.9%
27.00	-6.6%	-5.1%	-4.4%	-3.8%	-3.3%
28.01	5.1%	-8.1%	-6.8%	-5.7%	-4.9%
28.02	28.0%	-7.9%	-6.6%	-5.6%	-4.8%
28.03	1.6%	-7.9%	-6.6%	-5.6%	-4.8%
100.01	77.3%	-8.0%	-6.7%	-5.6%	-4.8%
100.02	N/A	2178.7%	-6.3%	-5.4%	-4.6%
100.03	28.0%	-3.1%	-6.4%	-5.4%	-4.7%
100.041	52628.6%	85.0%	-5.4%	-4.5%	-4.0%
100.042	6.7%	N/A	633.2%	-6.2%	-5.3%
100.043	50.3%	N/A	N/A	N/A	-6.3%
100.05	9493.2%	-7.4%	-6.2%	-5.3%	-4.5%
100.06	N/A	51.7%	-4.8%	-5.4%	-4.7%
100.071	N/A	203.8%	-5.9%	-5.0%	-4.3%
100.072	N/A	N/A	N/A	96.6%	100.3%
100.073	N/A	N/A	N/A	N/A	N/A
100.074	N/A	N/A	1396.6%	80.8%	-5.3%
100.075	N/A	N/A	N/A	N/A	1936.4%
100.076	N/A	N/A	N/A	N/A	263.2%
100.077	N/A	N/A	N/A	7.7%	-5.5%
Total	7.4%	8.5%	6.0%	5.4%	6.6%

Figure 1: Dwelling Units Occupancy Rate



APPENDIX A - METHODOLOGY

A.1 Information Sources

The analysis is based on the following information sources:

- the 1981 and the 1986 Statistics Canada Census which provide total population for each C.T. within the City.

- cohort survival and household headship rates analyses which establish projected overall housing requirements (source: Planning Departments's report on Long Term Housing Requirements, 1986).

- the Assessment Department's Property Tax data-base and the Planning Department's Subdivision Plan Density Inventory which provide information on the existing housing volumes and densities in the expanding areas in the City in the North-West, the South-East and the East sectors.

A.2 The Projection Model

The projection model involves the following steps:

a) cohort survival population projections and historical data of household headship rates by sex/age cohort establish projections of overall housing requirements for the City of Regina.

b) the inventory of new subdivision plans in the North-West, South-East and East sectors provide:

   - lots available for development within subdivided lands,
   - gross density rates in the City's expanding areas,
   - development ratios between each sector.

c) measurements of gross available land within and outside the City limits, up to the proposed relocated rail lines in the North-West and the South-East, provide the geographic direction of housing development.

d) the above steps (b) and (c) establish the housing potential for development in the City's expanding areas.

e) Statistics Canada 1981 and 1986 Censuses provide data of the existing housing stock and population by C.T. A regression analysis between the housing occupancy rates, for each time period, provides the multipliers to convert the number of D.U. to population. These multipliers are applied to the D.U. statistics of the existing and potential housing stock.

f) information from the above steps (d) and (e) establish the future distribution of housing development by area.

g) information from step (f), combined with population multipliers and the existing housing stock by area, (step e), establish the population projections by area.

A.3 Regression Analysis

The regression analysis measures the relationship between the 1981 occupancy rates for each C.T., and the 1986 occupancy rates (the 1981 variable is defined as X, and the 1986 variable is defined as Y).

The occupancy rates are netted out after the exclusion of population residing in collective dwelling units (those units that do not provide tenants with their own private entrances, for example, nursing homes, correctional facilities, rooming houses, Table A.1).

A group of 22 C.T.'s were selected for the regression (Table A.2). The selection includes all the C.T.'s except those which have experienced an increase in the number of housing units between 1981 and 1986. Exclusion are made to avoid the influence of higher occupancy rates of recently developed housing.

The highest fit between X and Y was achieved through a cubic regression (in which X is measured simultaneously against single Y, squared Y and cubic Y). The resulting R squared rate was 0.912, which reflects a high level of confidence (Table A.3).

The resulting X coefficients and the Constant were used to establish the occupancy rates (Y estimate) for every 5-year projection period.

A.4 Future Adjustments

As previously discussed, no infill and demolition statistics were used for the City interior. This is due to both the insignificant level of infill (less demolition), and the highly speculative nature of this data. The user is advised to make the proper calculation adjustments for a given area when infill or demolition plans become available.

Table A.1: Residents in Collective Dwellings

Census Tract	Enumerat-ion Area	1981	1986
2.02	w15	153	152
2.02	w9	229	228
3.00	w26	2	0
5.00	w72	0	118
6.00	e101	12	4
6.00	e111	50	102
6.00	e120	171	194
10.00	e203	32	51
13.00	e223	0	1
14.00	e219	2	0
19.00	w106	10	46
22.01	w114	516	503
22.01	w115	8	4
22.01	w152	287	0
25.02	w211	73	73
27.00	e256	2	0
100.05	e273	0	4
Total		1,547	1,480

Note that this information is not based on a true survey but estimated from Statistics Canada listings of enumeration area population and housing. Where a zero value for the number of dwelling units was found in a given enumeration area, the related population was assumed to reside in Collective Dwelling Units.

Table A.2: Person / D.U.: 1981 (X) versus 1986 (Y): Cubic Regression Input

Census Tract	Population * 1981	Population * 1986	Dwelling Units (D.U.) 1981	Dwelling Units (D.U.) 1986	Change	1981 Person / D.U. X	X^2	[illegible]
23.02	4,682	4,472	1,544	1,408	(136)	2.03	9.20	27.99
6	6,192	5,733	2,387	2,282	(105)	2.59	6.73	17.46
2.02	7,448	6,917	2,782	2,710	(72)	2.68	7.17	19.19
8.01	6,548	6,050	2,487	2,421	(66)	2.63	6.93	18.25
14	1,992	1,817	858	800	(58)	2.32	5.39	12.51
21	2,751	2,487	1,010	956	(54)	2.72	7.42	20.21
10	2,802	2,661	1,425	1,372	(53)	1.97	3.87	7.60
15	2,582	2,423	852	810	(42)	3.03	9.18	27.83
20	3,477	3,156	1,346	1,310	(36)	2.58	6.67	17.22
4	2,073	1,914	850	817	(33)	2.44	5.95	14.51
5	4,920	4,693	1,837	1,806	(31)	2.67	7.14	19.07
7	1,789	1,775	779	757	(22)	2.30	5.27	12.11
9.01	4,435	4,288	1,835	1,814	(21)	2.42	5.84	14.12
22.01	2,571	2,166	764	745	(19)	3.37	11.32	38.11
1.02	4,455	4,125	1,550	1,534	(16)	2.87	8.26	23.73
3	5,593	5,257	2,222	2,207	(15)	2.51	6.31	15.86
23.01	4,074	3,738	1,112	1,098	(14)	3.66	13.42	49.19
17	2,162	1,989	713	702	(11)	3.03	9.19	27.85
2.01	3,849	3,505	1,321	1,320	(1)	2.91	8.49	24.73
24	3,697	3,358	1,077	1,077	0	3.43	11.78	40.45
25.01	4,382	4,026	1,537	1,537	0	2.85	8.13	23.17
19	4,713	4,582	1,852	1,853	1	2.45	6.01	14.75

* In order to provide accurate occupancy rates, population totals were adjusted to include only residents of private dwelling units. Census Tract 2.01 (Albert Park South), includes only the population of the area which was developed by the year 1981.

Table A.3: Cubic Regression Output

Constant			-0.0588
Std Err of Y Est			0.10383
R Squared			0.91150
No. of Observations			22
Degrees of Freedom			18
X Coefficient(s)	1.165048	-0.08013	0.00407
Std Err of Coef.	5.421316	1.956841	0.23197